Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

III SEMESTER B.TECH (AERONAUTICAL & AUTOMOBILE ENGINEERING)
END SEMESTER EXAMINATIONS, DEC 2015/JAN 2016

SUBJECT: THEORY OF AUTOMOTIVE ENGINES [AAE 2151]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A. Write the classification of I C engines based on arrangement of cylinders. **(02)**

1B. Explain the working principle of 2 stroke diesel engine and mention its advantages and disadvantages. **(05)**

1C. An engine at full load delivers 100 kW brake power. It requires 25 kW to rotate it without fuel at the same speed. Find its mechanical efficiency. Assuming that the mechanical losses remain constant, what will be the mechanical efficiency at a) half-load, b) quarter load? **(03)**

2A. Mention the objectives of supercharging? **(02)**

2B. With a neat sketch explain the side camshaft over-head valve mechanism. **(04)**

2C. What is meant by piston seizure? Mention the types of pistons used to avoid piston seizure? **(04)**

3A. How the strangler supplies more amount of Air after engine is started? **(02)**

3B. Explain the working principle of S.U carburetor during starting and full throttle condition. **(04)**

3C. In the carburetor of an automotive engine, the venture depression is found to be 102 cm. the diameter of jet is 1 mm, coefficient of discharge for a fuel is 0.65 and specific gravity of fuel is 0.78. Calculate the rate of flow of fuel through jet. **(04)**

4A. What are the stages of combustion in Diesel engine? **(02)**

4B. Explain clearly about the Ignition delay period in Diesel engines and also explain the parameters which affects the Ignition delay period. **(04)**

4C. Determine the diameter of a fuel orifice for a 4 stroke engine developing 15 kW per cylinder at 2000 revolutions per minute, using 0.272 kg/kW-hr fuel of 32° API. The duration of injection is 30° of crank travel. The fuel injection pressure is 120 bar and the combustion pressure is 30 bar. Take velocity coefficient 0.9 and $\int = (141.5) / (131.5+°API)$ **(04)**

5A. The Stirling engine belongs to which classification among Internal combustion engine and external combustion engine, and Explain why. **(02)**

5B. If the Pneumatic governor experiences more vacuum than optimum level, then what about the quantity of fuel supply to an engine? Explain clearly. **(04)**

5C. List the physical tests to check the quality of lubricant oil and briefly explain about each test. **(04)**